

L4 ANSWER 40 OF 49 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 11
ACCESSION NUMBER: 1983:608369 CAPLUS
DOCUMENT NUMBER: 99:208369
TITLE: **Isolation and characterization of the three fractions (DE-I, DE-II and DE-III) of rat-liver Z-protein and the complete primary structure of DE-II**
AUTHOR(S): Takahashi, Kuni; Odani, Shoji; Ono, Teruo
CORPORATE SOURCE: Sch. Med., Niigata Univ., Niigata, 951, Japan
SOURCE: Eur. J. Biochem. (1983), 136(3), 589-601
CODEN: EJBCAI; ISSN: 0014-2956

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Three fractions (DE-I, DE-II, and DE-III) of Z-protein (fatty acid-binding protein) were isolated from rat liver cytosol by DEAE-cellulose chromatog.

and characterized. They had the same mol. wt. (14,000) and essentially identical amino acid compns. However, compns. of endogenous fatty acids differed strikingly from one another. Long-chain fatty acids detected in DE-II were palmitic, stearic, oleic, linoleic, and **arachidonic acids**. In contrast to DE-II, DE-III contained mainly **arachidonic acid**. Molar ratios of endogenous long-chain fatty acids to both DE-II and DE-III were estd. to be .apprx.1.0. Unlike the latter 2 fractions, DE-I was virtually lipid-free. Analyses of the 3 fractions by polyacrylamide gel electrophoresis, electrofocusing, and DEAE-cellulose chromatog. before and after delipidation suggested that

the difference between DE-I and DE-II was in part due to fatty acids bound to DE-II. In contrast, DE-III appeared to be somewhat different from these forms in its protein structure, though tryptic peptide mappings of the 3 fractions did not reveal clear differences among them. Anal. of the primary structure was made on the most abundant fraction, DE-II, to investigate the relation among the 3 fractions and to other proteins.

The protein was a single chain consisting of 127 amino acid residues and had a

mostly acetylated N-terminus and a free SH group. The complete sequence of Z-protein showed striking homol. to cellular retinoid-binding proteins and peripheral nerve myelin P2 protein, which indicated the presence of a new family of cellular lipid-binding proteins diverged from a common ancestor. A possible intragenic duplication of Z-protein was also suggested.

L4 ANSWER 47 OF 49 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1954:9342 CAPLUS

DOCUMENT NUMBER: 48:9342

ORIGINAL REFERENCE NO.: 48:1705f-h

TITLE: Highly unsaturated fatty acids. I. A survey of possible animal sources

AUTHOR(S): Holman, Ralph T.; Greenberg, Sheldon I.

CORPORATE SOURCE: Univ. of Minnesota, Austin

SOURCE: J. Am. Oil Chemists' Soc. (1953), 30, 600-1

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB The lipides were extd. from various tissues of lambs, hogs, and cattle, and the content of tetraenoic, pentaenoic, and hexaenoic acids were detd. in the lipides. The data in some cases include figures on lipide yield and the per cent of the above acid types in ovaries, testes, uterus, liver, brains, kidney, adrenals, spleen, heart, spinal cord, pancreas, spermatocord, pituitary, yellow bone marrow, blood, thyroid, parathyroid, and thymus. Lipides from reproductive and glandular tissues have the highest contents of polyunsatd. acids. Lamb-testes lipide contg. 15.6% hexaenoic acid was found to be the richest source of this acid. It also contained 10.3% **arachidonic acid**. The most practical sources for **isolation** as well as content are beef-testes lipide and hog-brain lipide for hexaenoic acid and hog-liver lipide for **arachidonic acid**. To obtain the lipides from the original material EtOH extn. was preferred. 14 references.

L4 ANSWER 48 OF 49 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1944:20500 CAPLUS

DOCUMENT NUMBER: 38:20500

ORIGINAL REFERENCE NO.: 38:2930d-f

TITLE: The polyethylenic fat acids from the liver
of *Carcharodon carcharias*. III. **Separation**
and constitution of **arachidonic acid**
C20H32O2

AUTHOR(S): Baudart, Pierre

SOURCE: Bull. soc. chim. (1942), 9, 919-22

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB cf. C. A. 37, 5371.4. After sepg. the clupanodonic acid, the highly
unsatd., insol., liquid fatty acids from the liver of *Carcharodon*
carcharias were subjected to a no. of alternate fractional crystns. of
the

Na salts in acetone and fractional distns. of the Me esters, to yield Me
arachidonate (I), b0.6-0.8 194-6.degree., d204 0.9168, n20D 1.4875, R. M.
99.7 (calcd. 98.85), sapon. no. 176.2 (theoretical 176.0), iodine index
316 (theoretical 320). Oxidation of I by KMnO4 in acetone gives acetic,
succinic and adipic acids, while ozonization of the Am ester yields
acetic, succinic and adipic acids along with AcH. From this it is
concluded that **arachidonic acid** is
6,10,14,18-eicosatetraenoic acid (cf. Toyama and Tsuchiya, C. A. 29,
6209.1, 8378.6).

L5 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1992:588082 CAPLUS

DOCUMENT NUMBER: 117:188082

TITLE: Production of 5,8,11-cis-eicosatrienoic acid by a
.DELTA.12-desaturase-defective mutant of

Mortierella alpina 1S-4

AUTHOR(S): Jareonkitmongkol, Saeree; Kawashima, Hiroshi;
Shimizu,

Sakayu; Yamada, Hideaki

CORPORATE SOURCE: Dep. Agric. Chem., Kyoto Univ., Kyoto, 606, Japan

SOURCE: J. Am. Oil Chem. Soc. (1992), 69(9), 939-44

CODEN: JAOCA7; ISSN: 0003-021X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A mutant defective in .DELTA.12-desaturase of an arachidonic-acid
producing fungus, **Mortierella** alpina 1S-4, was shown to be a
novel potent producer of Mead acid (5,8,11-cis-eicosatrienoic acid,
20:3.omega.9). The fungus produced several fatty acids of the n-9
family,
i.e., 6,9-cis-octadecadienoic acid (18:2.omega.9), 8,11-cis-eicosadienoic
acid (20:2.omega.9) and 20:3.omega.9. Significantly high levels of these
fatty acids were produced during growth at low temps. (12-20.degree.).

On submerged cultivation at 20.degree. for 10 days in a 5-L fermentor contg.
2% glucose plus 1% yeast ext. (pH 6.0), the prodn. of 20:3.omega.9

reached
.apprx.0.8 g/L (56 mg/g dry mycelia), accounting for 15% (by wt.) of the
total mycelial fatty acids. The other major fatty acids were palmitic
acid (6%), stearic acid (11%), oleic acid (45%), 18:2.omega.9 (12%) and
20:2.omega.9 (3%). Studies on the distribution of fatty acids among

lipid classes showed that, irresp. of the growth temp. employed
(12-28.degree.),

.apprx.70% (by mol) of 20:3.omega.9 was present in the triglyceride and
the remainder in the phospholipid fraction, esp. in phosphatidylcholine
(PC). When the fungus was grown at 12.degree., the proportion of
20:3.omega.9 in the PC fraction was .apprx.55%.

L5 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1993:211438 CAPLUS
DOCUMENT NUMBER: 118:211438
TITLE: Microbial manufacture of .omega.-9 polyunsaturated fatty acid
INVENTOR(S): Kawashima, Hiroshi; Yamada, Hideaki; Shimizu, Sakayu
PATENT ASSIGNEE(S): Suntory, Ltd., Japan
SOURCE: Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 535939	A1	19930407	EP 1992-308927	19920930
EP 535939	B1	19970709		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT,				
SE				
JP 05091888	A2	19930416	JP 1991-251966	19910930
US 5322780	A	19940621	US 1992-953030	19920929
AT 155172	E	19970715	AT 1992-308927	19920930
ES 2103895	T3	19971001	ES 1992-308927	19920930
			JP 1991-251966	19910930

PRIORITY APPLN. INFO.:

AB .omega.-9 Polyunsatd. fatty acids are manufd. with microorganisms with altered patterns of fatty acid desaturases, e.g., those with normal .DELTA.5 and .DELTA.6 desaturase activity but deficient in .DELTA.12 desaturase activity. A *Mortierella alpina* mutant was incubated for 10 days in medium without or with Me oleate. The yields of 6,9-octadecadienoic acid (I), of 8,11-eicosadienoic acid (II), and of 5,8,11-eicosatrienoic acid (III) were, without Me oleate: I, 0.25; II, 0.04; III, 0.23; and with Me oleate: I, 0.71; II, 0.16; III, 0.70 g/L medium.

L5 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1992:444344 CAPLUS

DOCUMENT NUMBER: 117:44344

TITLE: Fatty acid desaturation-defective mutants of an
arachidonic-acid-producing fungus, *Mortierella*
alpina 1S-4

AUTHOR(S): Jareonkitmongkol, Saeree; Shimizu, Sakayu; Yamada,
Hideaki

CORPORATE SOURCE: Dep. Agric. Chem., Kyoto Univ., Kyoto, 606, Japan

SOURCE: J. Gen. Microbiol. (1992), 138(5), 997-1002

CODEN: JGMIAN; ISSN: 0022-1287

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Three mutants, which were defective in the desatn. of fatty acids, were
isolated from an arachidonic-acid-producing fungus, *M. alpina* 1S-4, after
treating wild-type spores with N-methyl-N'-nitro-N-nitrosoguanidine.

They were designated Mut44, Mut48, and Mut49. Mut44 was a mutant with low
.DELTA.5-desaturase activity. It accumulated a high level of
dibromo-.gamma.-linolenic acid (DGLA) (28.6%, wt./wt.) but a low level of
arachidonic acid (Ara) (10.6%), compared with the wild type, which had
levels of 6.3 and 47.0%, resp. Mut48 was unable to desaturate oleic acid
(18:1) to linoleic acid (18:2), i.e., .DELTA.12-desatn., and therefore a
large amt. of 18:1 (49.5%) accumulated and no fatty acid of the .omega.-6
family was detected. In addn., several fatty acids of the .omega.-9
family, such as 5,8,11-cis-eicosatrienoic acid, were found. In Mut49,
18:2 (46%) accumulated markedly, but only small amts. of DGLA and Ara

were detected. Thus, Mut49 was considered to be defective in .DELTA.6-desatn.
These mutants showed a somewhat longer lag phase than the wild type on
cultivation at both 28 and 12.degree.C.

L5 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1998:97899 CAPLUS
DOCUMENT NUMBER: 128:204097
TITLE: Production of C20 polyunsaturated fatty acids by
microbial processes
AUTHOR(S): Shimizu, S.
CORPORATE SOURCE: Department of Agricultural Chemistry, Kyoto
University, Kyoto, 606, Japan
SOURCE: Oils-Fats-Lipids 1995, Proc. World Congr. Int. Soc.
Fat Res., 21st (1996), Meeting Date 1995, Volume 1,
103-109. P.J. Barnes & Associates: Bridgwater, UK.
CODEN: 65QOAT

DOCUMENT TYPE: Conference

LANGUAGE: English

AB **Mortierella** fungi were found to be potent producers for
arachidonic acid (AA), dihomogamma-linolenic acid (DHGA) and
5(Z),8(Z),11(Z),14(Z),17(Z)-eicosapentaenoic acid (EPA). A soil isolate,
Mortierella alpina 1S-4, produced 4.3 g/L (274 mg/g dry mycelia;
65% of total mycelial fatty acids) of AA upon cultivation in a medium
contg. glucose and yeast ext. It also produced EPA when grown at low
temp. (10°C) or when grown in a medium supplemented with
alpha-linolenic acid, the max. yield of EPA being 1.88 g/L. When grown
in the presence of sesame oil, the same fungus accumulated DHGA (2.2

g/L). This was found to be due to specific inhibition of .DELTA.5 desaturase by
sesamin and related lignan compds. present in the oil. Mutants which are
considered to be defective (or to have low activity) in .DELTA.5,
.DELTA.6, .DELTA.12, .DELTA.9 and .omega.3 desaturase were derived from

M. alpina 1S-4. Mutant Mut44 and S14 have low .DELTA.5-desaturase activity,
accumulating a high DHGA level. The max. prodn. (3.2 g/L) of DHGA was
obtained with Mut44, but the max. content (43.3% of total mycelial fatty
acids) of DHGA in the oils was obtained with S14 strain. Mutant Mut48 is
completely defective in .DELTA.12 desaturase, producing three n-9 PUFA,
i.e., 6(Z),9(Z)-octadecadienoic acid, 8(Z),11(Z)-eicosadienoic acid and
5(Z),8(Z),11(Z)-eicosatrienoic acid (20:3 .omega.9). The prodn. of 20:3
.omega.9 by this mutant was 0.8 g/L (15% of total mycelial fatty acids).
Two nonmethylene-interrupted PUFA, 5(Z),11(Z),14(Z)-eicosatrienoic acid
and 5(Z),11(Z),14(Z),17(Z)-eicosatetraenoic acid, were found in the
.DELTA.6 desaturase-defective mutant. Two other mutants, T4 and K1, were
considered to have defects in .DELTA.9 and .omega.3 desaturase, resp. T4
accumulated a high level (38%) of stearic acid, and K1 did not produce

n-3 fatty acids which are usually found on growth of the parental strain at
low temp.